

REMARKS

The Final Office Action dated May 11, 2004, has been received and reviewed.

Claims 1-67 are currently pending in the above-referenced application.

Claims 1-13, 17-26, 31-33, 37-40, and 42-44, which have been considered, stand rejected.

Claim 40 has been canceled without prejudice or disclaimer.

Claims 14-16, 27-30, 34-36, 41, and 45-67 have been withdrawn from consideration.

Reconsideration of the above-referenced application is respectfully requested.

Information Disclosure Statement

Please note that a Supplemental Information Disclosure Statement was filed in the above-referenced application on January 27, 2004, but that the undersigned attorney has not yet received any indication that the references cited in the Supplemental Information Disclosure Statement have been considered in the above-referenced application. It is respectfully requested that the references cited in the Supplemental Information Disclosure Statement of January 27, 2004, be considered and made of record in the above-referenced application and that an initialed copy of the Form PTO/SB/08A that accompanied that Supplemental Information Disclosure Statement be returned to the undersigned attorney as evidence of such consideration.

Rejections Under 35 U.S.C. § 102(e)

Claims 1-10, 17, 19-26, 33, 37-40, and 42-44 stand rejected under 35 U.S.C. § 102.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single reference which qualifies as prior art under 35 U.S.C. § 102. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Foster

Claims 1-10, 17, 19-26, 33, 40, and 42-44 have been rejected under 35 U.S.C. § 102(e) for reciting subject matter which is allegedly anticipated by the subject matter disclosed in U.S. Patent 6,552,416 to Foster (hereinafter “Foster”).

Foster describes a variety of multichip modules that include tape 32, die attach paste 33, and inner-lead traces 21 between stacked dies 30 and 31. *See, e.g.*, FIG. 8; col. 4, lines 50-57; col. 5, lines 16-23. In particular, the multichip module shown in FIG. 8 of Shim includes a first die 31 with centrally located bond pads, die attach paste 33 on regions of the active surface of the first die 31, which secures inner-lead traces 21 to the active surface of the first die 31, tape 32 over the inner-lead traces 21, and more die attach paste 33 securing the tape 32 to the back side of another semiconductor die 30.

Independent claim 1, as proposed to be amended herein, is directed to a semiconductor device that includes a semiconductor die and a dielectric spacer layer. The dielectric spacer layer is formed on and secured to at least a portion of a surface of the semiconductor die. It protrudes from the surface substantially a predetermined distance, which will space the semiconductor die substantially the predetermined distance apart from an adjacent semiconductor die, even before the dice are positioned adjacent to one another.

Foster does not expressly or inherently describe a semiconductor device including a spacer layer that protrudes from a surface of a semiconductor die substantially a predetermined distance the two dice 30 and 31 are to be spaced apart from one another before the dice are positioned adjacent to each other. More specifically, as the series of layers between the dice 30 and 31 of Foster include electrically conductive inner-lead traces 21, and since the inner-lead traces 21 contribute to the overall thickness of the series of layers, the series of layer cannot be characterized as “dielectric,” as required by independent claim 1.

Therefore, under 35 U.S.C. § 102(e), the subject matter recited in amended independent claim 1 is allowable over that disclosed in Foster.

Each of claims 2-10 and 17 is allowable, among other reasons, for depending either directly or indirectly from claim 1, which is allowable.

Claim 6 is additionally allowable because Foster does not expressly or inherently describe that the predetermined distance that the multi-layered spacing elements thereof protrudes from the surface of the lower semiconductor die 31 is the same as or less than the distance the bond wires 35 protrude above the surface of the lower semiconductor die 31.

Claim 9 is further allowable since Foster lacks any express or inherent description that the multi-layered spacing elements thereof may include randomly arranged features.

Independent claim 19 is directed to a semiconductor device assembly that includes a first semiconductor device and a nonconfluent spacer layer. The nonconfluent spacer layer includes dielectric material secured to the active surface of the first semiconductor device. The nonconfluent spacer layer protrudes from the active surface substantially a predetermined distance the active surface of the first semiconductor device is to be spaced apart from a back side of a second semiconductor device before an intermediate conductive element is secured to any of the bond pads of the first semiconductor device. The predetermined distance accommodates the intermediate conductive elements.

In Foster, bond wires 35 are secured to the bond pads of the lower semiconductor die 31 and to the inner-lead traces 21, then tape 32 and die bonding paste 33 are placed over the inner-lead traces 21 so that the upper semiconductor die 30 may be positioned over the inner-lead traces 21 and the lower semiconductor die 31. Col. 4, lines 19-41; col. 5, lines 20-23.

Foster neither expressly nor inherently describes that the die bonding paste 33, the inner-lead traces 21, and the tape 32, which dictate the distance the semiconductor dice 30 and 31 are separated from one another, may all be placed into position before bond wires 35 are secured to the bond pads of the lower semiconductor die 31. Therefore, Foster does not anticipate the element of amended independent claim 19 of a nonconfluent spacer layer that protrudes from a surface of a first semiconductor device substantially a predetermined distance the first semiconductor device is to be spaced apart from another, second semiconductor device *before an intermediate conductive element is secured to any of the bond pads of the first semiconductor device.*

As such, it is respectfully submitted that, under 35 U.S.C. § 102(e), amended independent claim 19 is directed to subject matter which is allowable over that described in Foster.

Claims 20-26, 33, and 42-44 are each allowable, among other reasons, for depending either directly or indirectly from claim 19, which is allowable.

Claim 26 is additionally allowable because Foster does not expressly or inherently describe that the predetermined distance that the multi-layered spacing elements thereof protrudes from the surface of the lower semiconductor die 31 is the same as or less than the distance the bond wires 35 protrude above the surface of the lower semiconductor die 31.

Claim 40 has been canceled without prejudice or disclaimer, rendering the rejection thereof moot.

Shim

Claims 1-10, 13, 17, 19-26, 32, 33, 37-40, and 42-44 stand rejected under 35 U.S.C. § 102(e) for being directed to subject matter which is purportedly anticipated by the subject matter described in U.S. Patent 6,531,784 to Shim et al. (hereinafter “Shim”).

Shim discloses elongated spacer strips 50A, 50B. FIGs. 4-6; col. 4, lines 33-38. The spacer strips 50A, 50B of Shim are formed from insulative material. Col. 4, lines 50-53. Apparently, the spacer strips 50A, 50B of Shim are preformed, as the teachings of Shim are limited to attachment or mounting (*e.g.*, with adhesive) thereof to a top surface of a semiconductor die 14. Col. 4, lines 56-60; col. 5, line 19; col. 5, lines 32-37; col. 5, lines 62-66.

Spacer strips 50A, 50B do not protrude from the top surface of semiconductor die 14 substantially the same distance that semiconductor die 14 is to be spaced apart from another semiconductor die 16. Rather, as shown in FIGS. 3, 7, 8, and 9 of Shim, once bond wires or other intermediate conductive elements are secured to the bond pads of semiconductor die 14 and to corresponding terminals of a substrate upon which semiconductor die 12 is positioned, an additional adhesive 44 (*see also*, col. 5, lines 10-14) or spacer strip 50C (*see also*, col. 6, lines 6-19) is required to space the second semiconductor die 16 the predetermined distance apart from the active surface of the first semiconductor die 14.

Shim includes no express or inherent description of a semiconductor device that includes a dielectric spacer layer that protrudes from a surface of a semiconductor die a predetermined distance that the semiconductor die is to be spaced apart from another semiconductor die *before the dice are positioned adjacent to one another*, as is required by amended independent claim 1. Instead, the description of Shim is limited to spacer strips 50A, 50B that protrude from the surface of a semiconductor die 14 only a portion of the distance the semiconductor die 14 is to be spaced apart from another semiconductor die 16.

Therefore, Shim does not anticipate each and every element of amended independent claim 1, as would be required to maintain the 35 U.S.C. § 102(e) rejection of amended independent claim 1.

Claims 2-10, 13, and 17 are each allowable, among other reasons, for depending either directly or indirectly from claim 1, which is allowable.

Claim 6 is additionally allowable because Shim does not expressly or inherently describe that the predetermined distance that the spacer strips 50A, 50B thereof protrudes from the surface of the lower semiconductor die 14 is the same as or less than the distance the bond wires or other intermediate conductive elements protrude above the surface of the lower semiconductor die 14.

Claim 9 is further allowable since Shim lacks any express or inherent description that the spacer strips 50A, 50B thereof may include randomly arranged features.

With respect to the subject matter recited in amended independent claim 19, Shim lacks any express or inherent description of a semiconductor device assembly that includes a first semiconductor device with a nonconfluent spacer layer protruding from an active surface thereof substantially a predetermined distance the active surface is to be spaced apart from a back side of the second semiconductor device *before an intermediate conductive element*, such as a bond wire, *is secured to any of the bond pads at the active surface of the first semiconductor device*. Rather, the spacers of Shim are not provided with their full heights, which are equal to the distances that semiconductor dice 14 and 16 are spaced apart from one another, until after intermediate conductive elements are secured to the bond pads of the lower semiconductor die 14.

Therefore, under 35 U.S.C. § 102(e), amended independent claim 19 is directed to subject matter which is allowable over the subject matter described in Shim.

Each of claims 20-26, 32, 33, 37-39, and 42-44 is allowable, among other reasons, for depending either directly or indirectly from claim 19, which is allowable.

Claim 26 is additionally allowable because Shim neither expressly nor inherently describes that the predetermined distance that the spacer strips 50A, 50B thereof protrudes from the surface of the lower semiconductor die 14 is the same as or less than the distance that bond

wires or other intermediate conductive elements protrude above the surface of the lower semiconductor die 14.

The rejection of claim 40, which has been canceled without prejudice or disclaimer, is moot.

In view of the foregoing, withdrawal of the 35 U.S.C. § 102(e) rejections of claims 1-10, 13, 17, 19-26, 32, 33, 37-40, and 42-44 is respectfully requested.

Rejections Under 35 U.S.C. § 103(a)

Shim in View of Smith

Claims 11 and 12 are rejected under 35 U.S.C. § 103(a) for being drawn to subject matter which is assertedly unpatentable over the teachings of Shim, in view of teachings from U.S. Patent 6,049,370 to Smith, Jr., et al. (hereinafter “Smith”).

Claims 11 and 12 are allowable, among other reasons, for depending from claim 1, which is allowable.

Shim in View of Blanton.

Claims 18 and 31 stand rejected under 35 U.S.C. § 103(a) for reciting subject matter which is purportedly unpatentable over the subject matter taught in Shim, in view of the teachings of U.S. Patent 5,220,200 to Blanton (hereinafter “Blanton”).

Claim 18 is allowable, among other reasons, for depending from claim 1, which is allowable.

Claim 31 is allowable, among other reasons, for depending from claim 19, which is allowable.

ELECTION OF SPECIES REQUIREMENT

It is respectfully submitted that independent claim 1 remains generic to all of the species of invention that were identified in the Election of Species Requirement in the above-referenced application. In view of the allowability of these claims, claims 14-16, 27-30, 34-36, 41,

and 45-67, which have been withdrawn from consideration, should also be considered and allowed. M.P.E.P. § 806.04(d).

ENTRY OF AMENDMENTS

It is respectfully submitted that the claim amendments that have been proposed herein should be entered because they do not introduce new matter. Moreover, the proposed claim amendments narrow the number of issues the remain for purposes of appeal.

If it is determined that the proposed claim amendments do not place the above-referenced application in condition for allowance, it is respectfully requested that they be entered in the event that a Notice of Appeal is filed in the above-referenced application.

CONCLUSION

It is respectfully submitted that each of claims 1-67 is allowable. An early notice of the allowability of each of these claims is respectfully solicited, as is an indication that the above-referenced application has been passed for issuance. If any issues preventing allowance of the above-referenced application remain which might be resolved by way of a telephone conference, the Office is kindly invited to contact the undersigned attorney.

Respectfully submitted,



Brick G. Power
Registration No. 38,581
Attorney for Applicant(s)
TRASKBRITT
P.O. Box 2550
Salt Lake City, Utah 84110-2550
Telephone: 801-532-1922

Date: July 12, 2004

BGP/nj:rmh
Document in ProLaw